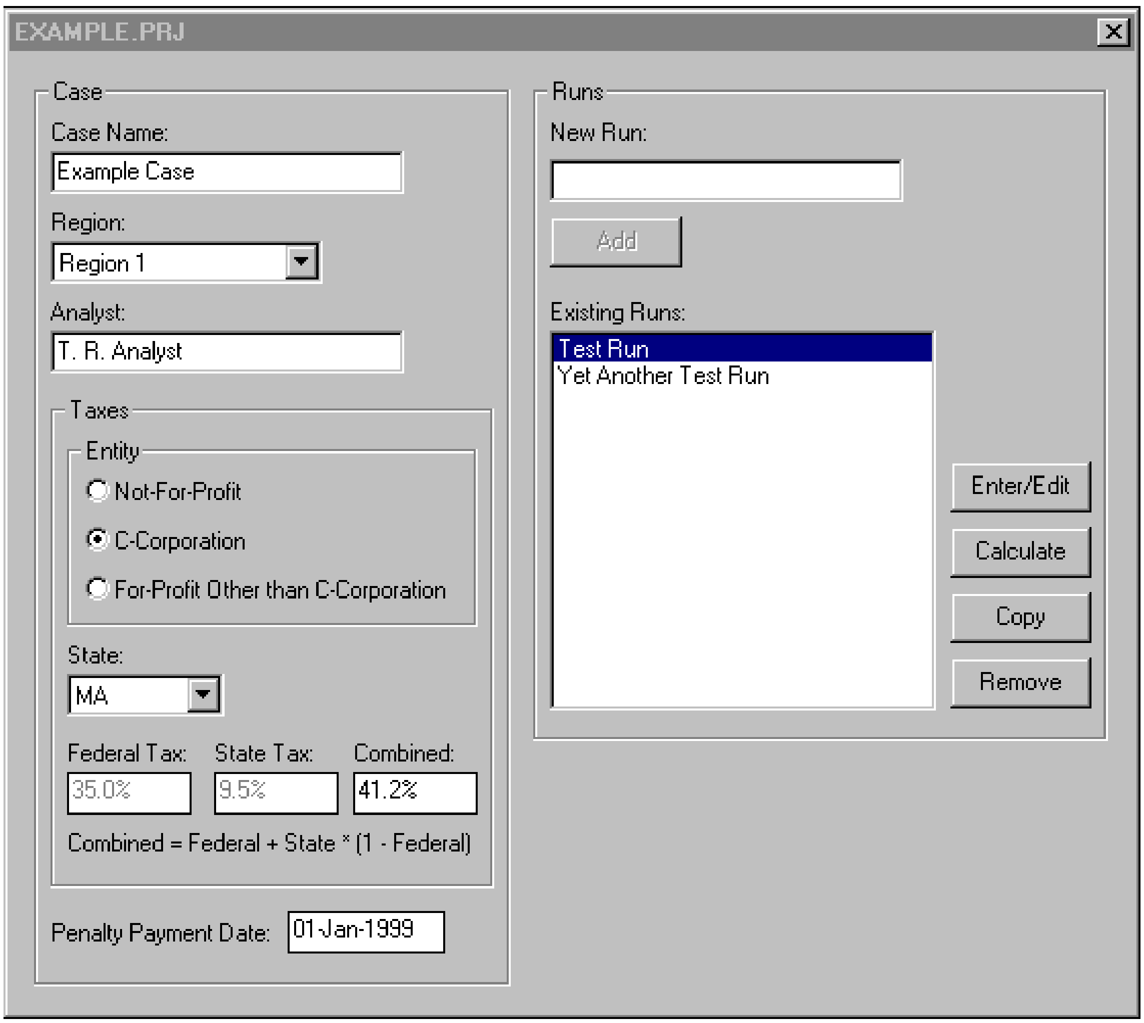
To calculate the after-tax net present value of supplemental environmental projects (SEP's), PROJECT requires the entity's tax status, state, penalty payment date, project cost estimates and dates, and project operation date. For the tax, inflation, and discount rates, you can either accept PROJECT's tailored default values or specify your own.

This chapter explains the variables in the order in which you enter them in PROJECT. The explanations include a brief description of the criteria you should use in developing the input values, and the basis for each of the standard values. Each explanation also contains a statement regarding how a change in the value of each variable will affect the PROJECT after-tax net present value result, as summarized below (holding all other variables constant).

Input Item	Direction of Change	Impact on Result
Entity Type	not-for-profit to c-corp. or other for-profit	decrease
Marginal Tax Rate	increase	decrease
Penalty Payment Date (PPD)	later	increase
Cost Estimates	increase	increase
Inflation Rates	increase	increase
Tax Deductibility of One-Time Nondepreciable Expenditure	tax-deductible to not tax-deductible	increase
Credited Years for Annual Costs	increase	increase
Project Operation Date (POD)	later	decrease
Discount Rate	increase	varies

A. CASE SCREEN

The case screen shown below is what you see when you first open PROJECT. This is where you enter the following variables: case name, EPA region, analyst name, entity type, state, tax rate, penalty payment date, and run name. It is also where you add, edit, calculate and remove runs.



1. <u>Case Name, EPA Region, Analyst Name</u>

Case name, analyst name, and EPA region are the first three inputs in PROJECT. They are for reference purposes only and do not affect the calculation. Each of them will appear along with the current date on the bottom of every page of the results.

a. Case Name

Case name is the first input in PROJECT. This name can be any length and can contain letters, spaces, punctuation and numbers (although you may not leave it blank). It will appear along with the current date, analyst name, and EPA region on each page of the results. Since its sole purpose is documentation, this label can contain anything you choose. It can reflect the violator's name, the name of a specific SEP, or a characteristic of the specific case (e.g., "Payment on July 15, 1999"). Each case can contain several runs, so you will not need to alter the case name to save individual calculations.

b. EPA Region

Like case name, EPA Region is for reference purposes only (although you may not leave it blank). It will appear along with the current date, case name, and analyst name on each page of the results. A pull down menu to the right of the cell lists all ten EPA regions, EPA headquarters, and the option of "other." PROJECT will not allow you to type in a different value.

c. Analyst Name

Like case name and EPA region, analyst name is for reference purposes only (although you may not leave it blank). This name can be of any length and can contain letters, spaces, punctuation and numbers. It will appear along with the current date, case name, and EPA region on each page of the results. It can be anything you choose, but it is most appropriate to simply enter your own name.

2. Entity Type, State, Customized Tax Rate

PROJECT needs to know the violator's tax rate to calculate the after-tax net present value of a SEP, since project costs are generally tax-deductible. Because tax-deductible expenses and depreciation associated with capital investments reduce taxable income, they result in tax savings. PROJECT uses the marginal tax rate to account for the tax effects of project costs. The higher the tax rate, the higher the tax savings, and therefore the lower the after-tax value of the SEP. Changing the violator's state or tax status changes the violator's marginal tax rate and thus alters the value of a proposed SEP.

a. Entity Type

PROJECT asks you to designate the tax filing status of the entity, either Not-For-Profit, C-Corporation, or For-Profit Other than C-Corporation. Choosing the correct tax status is critical, because it determines PROJECTS's application of the tax rate and the discount rate. PROJECT will default to C-Corporation status.

A C-Corporation files a federal tax Form 1120 or Form 1120-A. These companies are taxed at corporate income tax rates. Virtually all publicly traded companies are C-Corporations, but small private firms can also be C-Corporations.

For-profit entities other than C-corporations may be S-corporations, partnerships, or sole proprietorships (e.g., a corner grocery store). These entities file federal tax returns other than 1120 or 1120-A (e.g., an S- corporation files a Form 1120-S and a Schedule K for each shareholder). The income and expenses of these organizations are divided among the shareholders and reported on their individual income tax returns. Income is therefore taxed at the individual income tax rate.

Not-for-profit entities, such as municipalities, public authorities, and charitable organizations, generally have a tax-exempt status. When you indicate that the violator is a not-for-profit entity, PROJECT sets the marginal income tax rate to zero. (Although rare, certain not-for-profit companies are subject to taxation. You should verify the status of the not-for-profit in question and adjust the tax rates accordingly.)

b. State

This is the state in which the entity conducts the majority of its business, which is not necessarily the state in which it is incorporated. Selecting the correct state is important because PROJECT uses a state-specific tax rate in its calculations. The pull-down menu lists all fifty states plus "AVG", which is an average of all state tax rates (appropriate if the proposed SEP involves several states).

c. Customized Tax Rate

After you have entered the tax status and state of the violator, PROJECT will automatically calculate the marginal combined tax rate. The marginal income tax rate is the fraction of the last dollar of taxable income that a defendant would pay to federal and state governments. PROJECT uses the marginal tax rate, not the average tax rate (i.e., total tax divided by total taxable income), because the marginal tax rate is the rate that applies to incremental changes in the violator's tax-deductible expenses.

State tax rates must be adjusted to reflect their deductibility from federal taxes. The adjustment is made by multiplying the marginal state tax rate by a factor equal to one minus the marginal federal tax rate, as shown in the following formula:

Combined tax rate = Federal rate + [State rate x (1 - Federal rate)]

State income taxes do not include sales tax, inventory tax, charter tax, or taxes on property. One-time tax payments, such as taxes on the purchase of equipment, should be included in capital investments or in one-time nondepreciable expenditures. If the tax recurs regularly, then it should be included in annually recurring costs. For example, sales tax would be included in the capital cost while property tax would be included in annual cost.

PROJECT assumes that the expenses (including depreciation) of SEP's are deductible from a violator's income for tax purposes. If the Internal Revenue Service concludes that these expenses are not tax-deductible, the tax savings associated with the project would will be zero, and therefore the appropriate value for the marginal tax rate will be zero. You should generally assume that such costs are tax-deductible, and apply an appropriate marginal tax rate (i.e., not zero). If you need further guidance on this issue, please contact Jonathan Libber of the Multimedia Enforcement Division at 202-564-6102 or e-mail him at libber.jonathan@epamail.epa.gov.

If you have information that supports the use of tax rates other than those supplied by the PROJECT model (e.g., the entity was not subject to the highest marginal rate), you may modify the combined tax rate. To do so, simply select the tax rate and type over the standard value. Remember to enter the tax rate as a decimal. PROJECT will automatically convert it to a percentage.

When the tax rate has been modified, a note indicating the modification will appear in the PROJECT run results. Note that once tax rates are modified, re-designation of the state or entity type will result in a loss of the customized information.

3. <u>Penalty Payment Date</u>

The penalty payment date is the date when the violator will make its actual payment to the government. If you vary the date of penalty payment, PROJECT automatically adjusts the SEP's present value by discounting the costs to the revised date. The present value of project costs will increase as the penalty payment date is pushed further into the future.

Dates may be entered as month/day/year (i.e. 7/31/98) or written out (i.e. July 31, 1998). PROJECT will accept two-digit years, but four-digit years are preferable. You must enter dates to the day. If you do not enter a day, PROJECT will assume the first of the month.

4. <u>Creating/Adding, Copying, and Removing Runs</u>

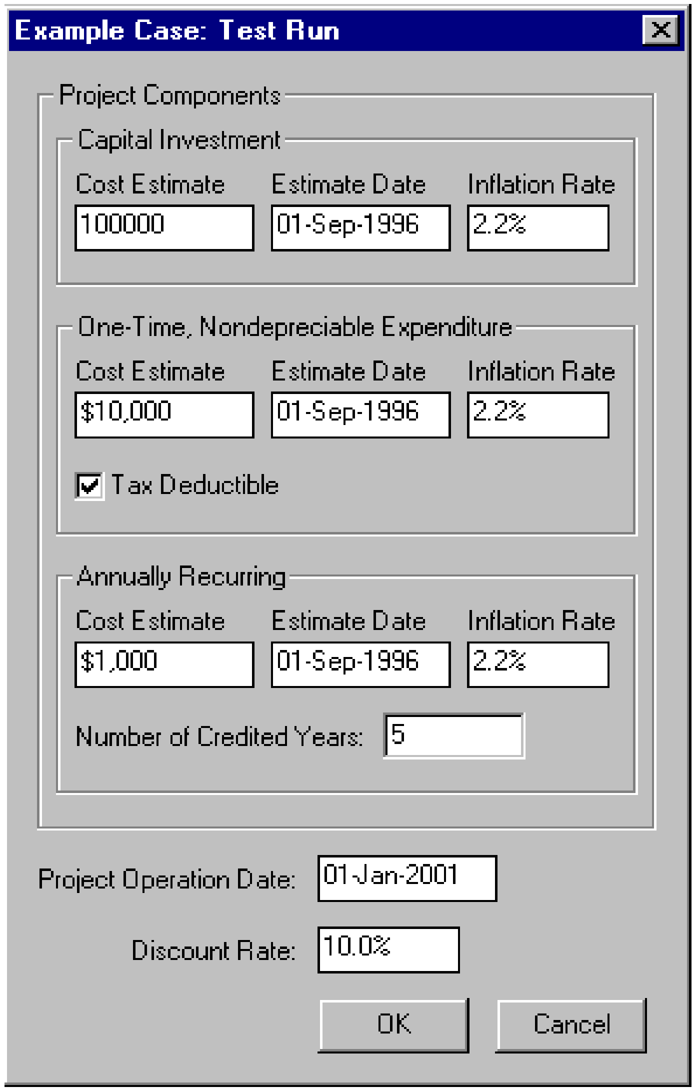
You must create a run before you can enter SEP cost information. To add a new run, enter the run name under "New Run:" and press **[Add]**. PROJECT will save the new run and list it under "Existing Runs." Run names can be any length and include any letter, punctuation or number. Each case may contain multiple runs. Addtional runs are useful when analyzing the net present value of more than one SEP for a particular case, or if you want to compare the effects of changing variables.

To copy an existing run select the run you wish to copy from the list of existing runs and press **[Copy]**. A window will appear asking you to enter a name for the new run. No two runs can have the same name. Enter the new name and press **[OK]** to save the new run or **[Cancel]** to delete it. The copy will contain all of the information from the original. Copies are particularly useful when making only minor changes in cost information from run to run, because they can be used to carry over consistent data.

To remove a run select it from the existing run window and press **[Remove]**. A window will appear asking you if you are sure. Press **[Yes]** and the run is deleted. Remember that PROJECT does not have a "trash bin" to hold deleted runs, so you will have no way to retrieve a run once you have removed it.

B. RUN INPUT SCREEN

To access the run input screen, select a run and press **[Enter/Edit],** or simply double click on the run name. Here you enter cost estimates for the SEP's three possible components: capital investments, one-time nondepreciable expenditures and annually recurring costs. Each cost component requires a cost estimate and an estimate date, with the additional option of overriding the default inflation rate. In addition, you can override the assumption that the one-time nondepreciable expenditure is tax deductible, as well as change the default assumption of five years of credited annually recurring costs. At the bottom of the run screen you must enter the project operation date and may alter the default discount rate. The run screen is shown on the next page.


Example Case: Test Run
Project Components
Capital Investment
Cost Estimate
Estimate Date
Inflation Rate
100000
01-Sep-1996
2.2%
One-Time, Nondepreciable Expenditure
Cost Estimate
Estimate Date
Inflation Rate
$10,000
01-Sep-1996
2.2%
Tax Deductible
Annually Recurring
Cost Estimate
Estimate Date
Inflation Rate
$1,000
01-Sep-1996
2.2%
Number of Credited Years:
5
Project Operation Date:
01-Jan-2001
Discount Rate:
10.0%
OK
Cancel

1. Cost Estimate Dates

Each cost estimate needs a date. This is the date on which the estimate of the SEP cost is based. Dates may be entered as month/day/year (i.e., 7/31/98) or written out (i.e., July 31, 1998). PROJECT will accept two-digit years, but four-digit years are preferable. You must enter dates to the day. If you do not have date information to the day, use the day that falls in the middle of the time frame you have. For example, if all you know is that the estimate was made in May of 1998, use May 15, 1998 as the estimate date. If all you know is that the estimate was made in 1998, use July 1, 1998 as the estimate date. If you do not enter a day, PROJECT will assume the first day of the month. If you have costs with different dollar-years, enter them as separate runs, and sum the separate runs' results.

2. Inflation Rate

The inflation rate in PROJECT is the annual rate at which the costs of environmental control projects are expected to increase over time. These cost increases are the result of various factors affecting supply and demand for particular products and services, as well as general inflationary pressures in the economy. PROJECT uses this rate to adjust the cost of SEP's from the cost estimate date to the project operation date. The higher the inflation rate, the higher the value of the SEP will be at the project operation date.

PROJECT's inflation rate is based on the "Plant Cost Index" (PCI) published in *Chemical Engineering* magazine. The PCI is used rather than another index (e.g., the Consumer Price Index, or the GDP Implicit Price Deflator), because it more accurately reflects the costs of activities associated with pollution-control expenditures. The PCI is based on cost changes in typical components of pollution control, including equipment, construction labor, buildings, and engineering and supervision.

To calculate future inflation, PROJECT extrapolates the PCI forward in time at a forecasted rate based upon a consensus forecast for the Consumer Price Index (CPI) and the PCI's historical relationship to the CPI. (The rationale for the calibration of the PCI to the CPI is that the CPI — yet not the PCI — has widely available forecasts for projected inflation.)

The inflation rate for each SEP cost category may be modified individually because the different cost categories may be affected by different inflationary trends. If you have some reason to believe that a better inflation forecast for your purposes is available, or if you would like to obtain the detailed calculations for this projected rate (which is updated each year), please call EPA's helpline at 888-ECONSPT. If you customize the inflation rate be certain that you enter an annual rate and not a monthly or semiannual rate.

3. Component Cost Estimates

a. Capital Investment

The capital investment should include all depreciable investment outlays necessary to implement the SEP. Depreciable capital investments are usually buildings, equipment, or other long-lived assets.[6] Typical environmental capital investments include groundwater monitoring wells, stack scrubbers, and wastewater treatment systems. In addition to these conventional capital investments, capital costs may also be associated with projects that do not appear at first to be capital investments. For example, a project to restore a wetland may include capital costs like pipes and pumps.

You may enter capital costs with or without commas or dollar signs. PROJECT will accept decimals but will round the amount to the nearest whole dollar. Enter a zero if capital investment costs will not be incurred. All else being equal, a larger capital investment will result in a higher net present value for the SEP.

b. One-Time, Nondepreciable Expenditure

Include any one-time nondepreciable expenditures necessary to implement the SEP. Such costs could be for materials or labor needed to start up the project (excluding design and installation costs for capital equipment), engineering, financial, or other services (e.g., a training program, waste disposal), or purchasing land. If such expenditures must occur over time and regularly, rather than as a one-time event, enter them as an annually recurring cost. (For example, if the project involves dredging a stream for four years at $100,000 a year, your entry would be $100,000 as an annually recurring cost.)

You may enter the cost estimate with or without commas or dollar signs. PROJECT will accept decimals but will round the amount to the nearest whole dollar. Enter a zero if these costs will not be incurred. All else being equal, a larger one-time nondepreciable expenditure will result in a higher net present values for the SEP.

PROJECT next allows you to override the assumption that the one-time nondepreciable expenditure is tax-deductible. The only one-time nondepreciable expenditure that is not tax-deductible is land. Note that, all else being equal, overriding the tax-deductibility assumption will increase the PROJECT result.

c. Annually Recurring Costs

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[6] Note that land is not a depreciable capital investment. Land costs should be input as a one-time nondepreciable expenditure, and the tax-deductibility box should be unchecked.

For the annually recurring costs associated with implementation of the SEP, enter the net change in expenditures for labor, power, water, raw materials, supplies, training, waste disposal, recycling, lease payments, and property taxes. Annual costs, however, should not include annualized capital recovery, interest payments, or depreciation. Do not enter any annual costs that appear speculative or unsubstantiated.

For some SEP's, the annual cost may be a negative number to reflect net cost savings associated with implementation of the project. (This is particularly likely for a pollution prevention capital improvement, which may make the production process more efficient, e.g., by reducing electricity consumption and waste generation.) PROJECT will calculate the net cost to the company of such a project by evaluating both the capital investment for the new equipment and the operational cost savings.

You may enter annual costs with or without commas or dollar signs. PROJECT will accept decimals but will round the amount to the nearest whole dollar. Enter a zero if no annual costs will be incurred. All else being equal, larger annually recurring costs will result in higher net present values for the SEP.

Enter the number of years for which the annual costs will be credited. The number of years of annual costs should correspond to the number of years that the defendant is legally required to operate the project. EPA takes this position because it has no way to be sure the money will ever be spent on the project without such a legal requirement. The default value is five years because in most cases it would be impractical for the government to monitor a consent decree for more than five years.

PROJECT will not allow you to enter a value that exceeds 15 years. This restriction is based on the expectation that the government cannot continue to monitor whether the defendant is still implementing the SEP 15 or more years after start-up. Further, in most cases changes in technology, market conditions, and environmental conditions create too much uncertainty to reasonably assume that a project will be implemented in the same manner for more than 15 years. Finally, the useful life of capital equipment will typically be 15 years. In many cases these reasons justify limiting the entry for this variable to no more than five years.

You may enter annual costs with or without commas or dollar signs. PROJECT will accept decimals but will round the amount to the nearest whole dollar. Enter a zero if no annual costs will be incurred. All else being equal, larger annually recurring costs will result in a higher net present values for the SEP.

4. Project Operation Date

This is the date when the SEP will commence operation, which is generally when all capital investments and one-time nondepreciable expenditures will have been incurred, and/or the annual costs will first start to be incurred. For example, a pollution control project that requires the installation of a stack scrubber would not be considered operational until all capital costs for the scrubber are expended. In cases where the SEP involves only annual expenses, the project operation date is when the violator begins incurring those costs. The project operation date may occur before or after the penalty payment date. In virtually all cases, however, the project operation date will occur after the commencement of the enforcement action. (Otherwise, the violator is credited for a project that presumably would have been undertaken anyway.)

Holding all other variables constant, the present value of project costs will decrease as the project operation date is pushed further into the future.

Dates can be written out or entered in month/day/ year format. For example, January 4, 1998 can be written as January 4, 1998, Jan 4 1998, 1-4-98, or 1/4/1998. Four-digit years are preferable, although PROJECT will accept some two-digit formats. If using numerical abbreviations, be sure to enter the month first, e.g., PROJECT will interpret 10/2/98 as October 2, 1998, not February 10, 1998.

5. Discount Rate

To compare cost estimates from different dates, PROJECT calculates the initial present value of the costs as of the project operation date, and then the final value as of the penalty payment date. To perform these present value calculations, PROJECT must employ a discount rate that reflects the violator's "time value of money."

PROJECT uses the weighted-average cost of capital ("WACC") to discount cash flows for all for-profit entities. The WACC represents the average cost of capital to the violator, after taxes, assuming constant risk and constant capital structure. PROJECT uses the cost of municipal debt as the basis for the discount rate for not for-profit organizations. When you indicate that the violator is a not for-profit entity, PROJECT automatically defines the discount rate based on average municipal bond yields.

Violators may occasionally request an adjustment in the discount rate to reflect their financial condition more precisely. Make the violator aware that a case-specific analysis could change the discount rate in a way that would lead to a lower present value for the SEP. Furthermore, a case-specific analysis for the PROJECT discount rate might also affect the BEN discount rate. If you alter the discount rate, be sure to enter it as a decimal. PROJECT will automatically convert it to a percentage.

Each year the standard-value discount rates are updated. If you have any questions about the discount rate, including the detailed derivation of the standard values, or guidance on tuning the discount rate to a specific violator or industry, please contact the EPA helpline at 888-ECONSPT.